## SEQUENCE LISTING

Stoehr, Jonathan P Schueler, Kathryn L Clee, Susanne Michell
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							atc Ile 645										1970
	cgc Arg 655	tct Ser	gaa Glu	tgg Trp	cag Gln	ctg Leu 660	gtc Val	aaa Lys	gta Val	gat Asp	tac Tyr 665	aag Lys	tcc Ser	att Ile	ttt Phe	gat Asp 670	2018
							gac Asp										2066
(	Gly 999	gaa Glu	gca Ala	tgt Cys 690	atc Ile	atg Met	gga Gly	gca Ala	aaa Lys 695	agg Arg	ata Ile	tat Tyr	aag Lys	aag Lys 700	cga Arg	aaa Lys	2114
				_	_	_	caa Gln				_		_	_	_		2162
							gag Glu 725										2210
(	gag Glu 735	cga Arg	cac His	agc Ser	aat Asn	ggc Gly 740	cag Gln	tgc Cys	ctg Leu	ccg Pro	gca Ala 745	ttt Phe	tgg Trp	ttc Phe	aat Asn	cca Pro 750	2258
1	tcc Ser	tct Ser	ctg Leu	tca Ser	aag Lys	gat Asp	tgc Cys	agc Ser	ttg Leu	gga Gly	cag Gln	agt Ser	tac Tyr	ctc Leu	aat Asn	agt Ser	2306

755 760 765

					gtg Val											2354
gaa Glu	cag Gln	tac Tyr 785	act Thr	gcc Ala	aaa Lys	ccg Pro	cag Gln 790	aag Lys	tgc Cys	cca Pro	Gly 999	aaa Lys 795	gcc Ala	ccg Pro	cgg Arg	2402
					acg Thr											2450
cac His 815	aac Asn	gtc Val	act Thr	ctc Leu	atg Met 820	gtg Val	caa Gln	tta Leu	gaa Glu	gag Glu 825	ggt Gly	gat Asp	gtt Val	cag Gln	cgg Arg 830	2498
aca Thr	ctc Leu	atc Ile	caa Gln	gtg Val 835	gac Asp	ttt Phe	ggc Gly	gat Asp	ggt Gly 840	atc Ile	gcg Ala	gtg Val	tct Ser	tac Tyr 845	gtc Val	2546
aat Asn	ctc Leu	agc Ser	tcc Ser 850	atg Met	gaa Glu	gat Asp	Gly aaa	atc Ile 855	aaa Lys	cac His	gtc Val	tat Tyr	cag Gln 860	aac Asn	gtg Val	2594
ggc Gly	att Ile	ttc Phe 865	cgt Arg	gtg Val	acc Thr	gtg Val	cag Gln 870	gtg Val	gac Asp	aac Asn	agt Ser	ctg Leu 875	ggt Gly	tct Ser	gac Asp	2642
agc Ser	gcc Ala 880	gtc Val	ctg Leu	tac Tyr	tta Leu	cat His 885	gta Val	act Thr	tgt Cys	ccc Pro	ttg Leu 890	gag Glu	cac His	gtg Val	cac His	2690
ctg Leu 895	tct Ser	ctt Leu	ccc Pro	ttt Phe	gtc Val 900	acc Thr	aca Thr	aag Lys	aac Asn	aaa Lys 905	gag Glu	gtc Val	aat Asn	gcg Ala	acg Thr 910	2738
gca Ala	gtg Val	ctg Leu	tgg Trp	ccc Pro 915	agc Ser	caa Gln	gtg Val	ggc Gly	acc Thr 920	ctc Leu	act Thr	tac Tyr	gtg Val	tgg Trp 925	tgg Trp	2786
tac Tyr	gga Gly	aac Asn	aac Asn 930	acg Thr	gag Glu	cct Pro	ttg Leu	atc Ile 935	acc Thr	ttg Leu	gag Glu	gga Gly	agc Ser 940	ata Ile	tcc Ser	2834
ttc Phe	aga Arg	ttt Phe 945	act Thr	tca Ser	gaa Glu	gga Gly	atg Met 950	aat Asn	acc Thr	atc Ile	aca Thr	gtg Val 955	cag Gln	gtc Val	tca Ser	2882
					cta Leu											2930
gaa Glu 975	ttc Phe	cgg Arg	tct Ser	ctt Leu	cgc Arg 980	ttg Leu	tcc Ser	ttt Phe	tct Ser	cca Pro 985	aac Asn	ctg Leu	gat Asp	gac Asp	tac Tyr 990	2978
aac Asn	ccg Pro	gac Asp	atc Ile	cct Pro 995	gag Glu	tgg Trp	agg Arg	Arg	gac Asp .000	atc Ile	ggt Gly	cga Arg	Val	atc Ile .005	aaa Lys	3026

aaa tcc ctg gtg gaa gcc aca ggg gtt cca ggc cag cac atc ctg gtg Lys Ser Leu Val Glu Ala Thr Gly Val Pro Gly Gln His Ile Leu Val 1010 1015 1020	3074
gcg gtg ctc cct ggc tta ccc acc act gct gaa ctc ttt gtc cta ccc Ala Val Leu Pro Gly Leu Pro Thr Thr Ala Glu Leu Phe Val Leu Pro 1025 1030 1035	3122
tat cag gat cca gct gga gaa aac aaa agg tca act gat gac ctg gag Tyr Gln Asp Pro Ala Gly Glu Asn Lys Arg Ser Thr Asp Asp Leu Glu 1040 1045 1050	3170
cag ata tca gaa ttg ctg atc cac acg ctc aac caa aac tca gta cac Gln Ile Ser Glu Leu Leu Ile His Thr Leu Asn Gln Asn Ser Val His 1055 1060 1065 1070	3218
ttc gag ctg aag cca gga gtc cga gtc ctt gtc cat gct gct cac tta Phe Glu Leu Lys Pro Gly Val Arg Val Leu Val His Ala Ala His Leu 1075 1080 1085	3266
aca gcg gcc ccc ctg gtg gac ctc act cca acc cac agt gga tct gcc Thr Ala Ala Pro Leu Val Asp Leu Thr Pro Thr His Ser Gly Ser Ala 1090 1095 1100	3314
atg ctg atg ctc tca gtg gtg ttt gtg ggg ctg gca gtg ttc gtc Met Leu Met Leu Leu Ser Val Val Phe Val Gly Leu Ala Val Phe Val 1105 1110 1115	3362
atc tac aag ttt aaa agg aga gta gct tta ccc tcc cct ccc tcc cct Ile Tyr Lys Phe Lys Arg Arg Val Ala Leu Pro Ser Pro Pro Ser Pro 1120 1125 1130	3410
tct act caa cct ggt gac tca tct ctc cga ttg caa aga gca aga cac Ser Thr Gln Pro Gly Asp Ser Ser Leu Arg Leu Gln Arg Ala Arg His 1135 1140 1145 1150	3458
gcc act ccg cct tca acg cca aag cgg gga tct gct ggg gca cag tat Ala Thr Pro Pro Ser Thr Pro Lys Arg Gly Ser Ala Gly Ala Gln Tyr 1155 1160 1165	3506
gca att taaggaaaac ccccaaaggc tacaggcgac ctgctgatca ggaaagaatt Ala Ile	3562
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Ser Ala Ser Thr Pro Arg Gly Phe Ser His Gln Gly Arg Pro Gly Arg Ala Pro Ala Thr Pro Leu Pro Leu Val Val Arg Pro Leu Phe Ser Val Ala Pro Gly Asp Arg Ala Leu Ser Leu Glu Arg Ala Arg Gly Thr Gly Ala Ser Met Ala Val Ala Ala Arg Ser Gly Arg Arg Arg Ser Gly 105 Ala Asp Gln Glu Lys Ala Glu Arg Gly Glu Gly Ala Ser Arg Ser Pro 120 Arg Gly Val Leu Arg Asp Gly Gly Gln Gln Glu Pro Gly Thr Arg Glu Arg Asp Pro Asp Lys Ala Thr Arg Phe Arg Met Glu Glu Leu Arg Leu 150 Thr Ser Thr Thr Phe Ala Leu Thr Gly Asp Ser Ala His Asn Gln Ala 165 170 Met Val His Trp Ser Gly His Asn Ser Ser Val Ile Leu Ile Leu Thr 180 Lys Leu Tyr Asp Tyr Asn Leu Gly Ser Ile Thr Glu Ser Ser Leu Trp Arg Ser Thr Asp Tyr Gly Thr Thr Tyr Glu Lys Leu Asn Asp Lys Val 210 Gly Leu Lys Thr Ile Leu Gly Tyr Leu Tyr Val Cys Pro Thr Asn Lys 230 Arg Lys Ile Met Leu Leu Thr Asp Pro Glu Ile Glu Ser Ser Leu Leu Ile Ser Ser Asp Glu Gly Ala Thr Tyr Gln Lys Tyr Arg Leu Asn Phe Tyr Ile Gln Ser Leu Leu Phe His Pro Lys Gln Glu Asp Trp Ile Leu 280 Ala Tyr Ser Gln Asp Gln Lys Leu Tyr Ser Ser Ala Glu Phe Gly Arq Arg Trp Gln Leu Ile Gln Glu Gly Val Val Pro Asn Arg Phe Tyr Trp 310 315 Ser Val Met Gly Ser Asn Lys Glu Pro Asp Leu Val His Leu Glu Ala 325 330 Arg Thr Val Asp Gly His Ser His Tyr Leu Thr Cys Arg Met Gln Asn Cys Thr Glu Ala Asn Arg Asn Gln Pro Phe Pro Gly Tyr Ile Asp Pro 355 360 365

Asp Ser Leu Ile Val Gln Asp His Tyr Val Phe Val Gln Leu Thr Ser Gly Gly Arg Pro His Tyr Tyr Val Ser Tyr Arg Arg Asn Ala Phe Ala 390 395 Gln Met Lys Leu Pro Lys Tyr Ala Leu Pro Lys Asp Met His Val Ile Ser Thr Asp Glu Asn Gln Val Phe Ala Ala Val Gln Glu Trp Asn Gln 425 Asn Asp Thr Tyr Asn Leu Tyr Ile Ser Asp Thr Arg Gly Val Tyr Phe 440 Thr Leu Ala Leu Glu Asn Val Gln Ser Ser Arg Gly Pro Glu Gly Asn 455 Ile Met Ile Asp Leu Tyr Glu Val Ala Gly Ile Lys Gly Met Phe Leu 470 Ala Asn Lys Lys Ile Asp Asn Gln Val Lys Thr Phe Ile Thr Tyr Asn 490 Lys Gly Arg Asp Trp Arg Leu Leu Gln Ala Pro Asp Thr Asp Leu Arg 500 Gly Asp Pro Val His Cys Leu Leu Pro Tyr Cys Ser Leu His Leu His Leu Lys Val Ser Glu Asn Pro Tyr Thr Ser Gly Ile Ile Ala Ser Lys 535 Asp Thr Ala Pro Ser Ile Ile Val Ala Ser Gly Asn Ile Gly Ser Glu 550 Leu Ser Asp Thr Asp Ile Ser Met Phe Val Ser Ser Asp Ala Gly Asn 565 Thr Trp Arg Gln Ile Phe Glu Glu Glu His Ser Val Leu Tyr Leu Asp 585 Gln Gly Gly Val Leu Val Ala Met Lys His Thr Ser Leu Pro Ile Arg 600 His Leu Trp Leu Ser Phe Asp Glu Gly Arg Ser Trp Ser Lys Tyr Ser Phe Thr Ser Ile Pro Leu Phe Val Asp Gly Val Leu Gly Glu Pro Gly 630 635 Glu Glu Thr Leu Ile Met Thr Val Phe Gly His Phe Ser His Arg Ser 645 650 Glu Trp Gln Leu Val Lys Val Asp Tyr Lys Ser Ile Phe Asp Arg Arg 665 Cys Ala Glu Glu Asp Tyr Arg Pro Trp Gln Leu His Ser Gln Gly Glu 675

Ala Cys Ile Met Gly Ala Lys Arg Ile Tyr Lys Lys Arg Lys Ser Glu Arg Lys Cys Met Gln Gly Lys Tyr Ala Gly Ala Met Glu Ser Glu Pro Cys Val Cys Thr Glu Ala Asp Phe Asp Cys Asp Tyr Gly Tyr Glu Arg 730 His Ser Asn Gly Gln Cys Leu Pro Ala Phe Trp Phe Asn Pro Ser Ser 745 Leu Ser Lys Asp Cys Ser Leu Gly Gln Ser Tyr Leu Asn Ser Thr Gly Tyr Arg Lys Val Val Ser Asn Asn Cys Thr Asp Gly Val Arg Glu Gln 775 Tyr Thr Ala Lys Pro Gln Lys Cys Pro Gly Lys Ala Pro Arg Gly Leu Arg Ile Val Thr Ala Asp Gly Lys Leu Thr Ala Glu Gln Gly His Asn 810 Val Thr Leu Met Val Gln Leu Glu Glu Gly Asp Val Gln Arg Thr Leu 820 Ile Gln Val Asp Phe Gly Asp Gly Ile Ala Val Ser Tyr Val Asn Leu 840 Ser Ser Met Glu Asp Gly Ile Lys His Val Tyr Gln Asn Val Gly Ile 855 Phe Arg Val Thr Val Gln Val Asp Asn Ser Leu Gly Ser Asp Ser Ala 870 Val Leu Tyr Leu His Val Thr Cys Pro Leu Glu His Val His Leu Ser 890 Leu Pro Phe Val Thr Thr Lys Asn Lys Glu Val Asn Ala Thr Ala Val 900 Leu Trp Pro Ser Gln Val Gly Thr Leu Thr Tyr Val Trp Trp Tyr Gly 920 Asn Asn Thr Glu Pro Leu Ile Thr Leu Glu Gly Ser Ile Ser Phe Arg 930 Phe Thr Ser Glu Gly Met Asn Thr Ile Thr Val Gln Val Ser Ala Gly 950 Asn Ala Ile Leu Gln Asp Thr Lys Thr Ile Ala Val Tyr Glu Glu Phe 965 970 Arg Ser Leu Arg Leu Ser Phe Ser Pro Asn Leu Asp Asp Tyr Asn Pro Asp Ile Pro Glu Trp Arg Arg Asp Ile Gly Arg Val Ile Lys Lys Ser 1000 1005

- Leu Val Glu Ala Thr Gly Val Pro Gly Gln His Ile Leu Val Ala Val 1010 1015 1020
- Leu Pro Gly Leu Pro Thr Thr Ala Glu Leu Phe Val Leu Pro Tyr Gln 1025 1030 1035 1040
- Asp Pro Ala Gly Glu Asn Lys Arg Ser Thr Asp Asp Leu Glu Gln Ile 1045 1050 1055
- Ser Glu Leu Leu Ile His Thr Leu Asn Gln Asn Ser Val His Phe Glu 1060 1065 1070
- Leu Lys Pro Gly Val Arg Val Leu Val His Ala Ala His Leu Thr Ala 1075 1080 1085
- Ala Pro Leu Val Asp Leu Thr Pro Thr His Ser Gly Ser Ala Met Leu 1090 1095 1100
- Met Leu Leu Ser Val Val Phe Val Gly Leu Ala Val Phe Val Ile Tyr 1105 1110 1115 1120
- Lys Phe Lys Arg Arg Val Ala Leu Pro Ser Pro Pro Ser Pro Ser Thr
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- Gln Pro Gly Asp Ser Ser Leu Arg Leu Gln Arg Ala Arg His Ala Thr
  1140 1145 1150
- Pro Pro Ser Thr Pro Lys Arg Gly Ser Ala Gly Ala Gln Tyr Ala Ile 1155 1160 1165